

THE SEXUALITY OF THE TILOPTERIDACEÆ.¹

Ectocarpus pusillus Griffiths or *Acinetospora pusilla* Bornet possesses two forms of reproductive organs, the unilocular and plurilocular sporangia, whose elements present conditions intermediate between zoospores and aplanospores. I have recently encountered a third form of reproductive organ, the monosporangium, identical with that of *Haplospora Vidovichii* Bornet or *Heterospora Vidovichii* Kuckuck, and this last species ought henceforth to be placed in the genus *Acinetospora*.

These monospores are uninucleate, like the so-called oospheres of *Scaphospora speciosa* (said to be the sexual form of *Haplospora globosa*), and are covered by a membrane derived from the interior of the monosporangium, as are likewise the 4-nucleate monospores of *Haplospora globosa*. Since they possess a membrane before their dehiscence they cannot be fertilized. On account of the frothy structure of their protoplasm and the great variation in their dimensions, they resemble neither oospheres nor spores. They germinate readily in cultures and develop little plants that bear the same kind of reproductive organs. I regard them as *gemmae* or *propagula*, and the organ that contains them is a pseudosporangium. From what we know of the Cutleriaceæ and *Ectocarpus* it is possible that the plurilocular sporangia of *Acinetospora pusilla* are female organs whose oospheres germinate parthenogenetically. The antheridia will undoubtedly be found some day.

The same conclusion as to the nature of the monospores is justified for *Tilopteris* and *Haplospora*. We are no longer able to admit that these plants possess spores and oospheres similarly situated, of like form and similar dimensions, with the same protoplasmic structure and identical methods of germination, but that the spores germinate normally while the oospheres develop parthenogenetically. It seems more satisfactory to say that one or the other of the elements are *propagula* and that the 4-nucleate *propagula* are those that have begun to germinate upon the mother plant.

We shall say then that according to the present state of our knowledge the early known representatives of the *Tilopteridaceæ*, *Tilopteris*, and *Haplospora* propagate themselves solely vegetatively. The antheridia of *Tilopteris* give rise to true antherozoids that really seem to be rudimentary structures, but it is by no means certain that they

¹This contribution is a *résumé* by the author of the paper entitled "Les Acinetospora et la sexualité des *Tilopteridacées*," *Jour. de Bot.* 13: —. 1899. Translated by Dr. Bradley M. Davis.

are the same as those organs of Haplospora, however similar the type. We do not know of female organs, but we may foresee that they would have the form of plurilocular sporangia with a median cavity and a separate dehiscence for each little cell. Similarly one may foresee that the antheridia of Acinetospora will be provided with a median cavity and that the dehiscence will be common and terminal.

The Tilopteridaceæ have no affinity with the Fucaceæ with which they have often been placed in the classical works. On the contrary they approach very closely the Ectocarpaceæ and Cutleriaceæ. They may be divided into two tribes, the ACINETOSPOREÆ (genus Acinetospora), more closely related to the first; and the HAPLOSPOREÆ (genera Tilopteris and Haplospora), more closely related to the second. When these plants shall show us organs that are as yet unknown we shall without doubt have to raise the preceding tribes to the rank of families, the Acinetosporaceæ and Haplosporaceæ. I have shown in the table below a way in which the affinities of these plants may be represented.—CAMILLE SAUVAGEAU, *Dijon, France.*

